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PATENT ABSTRACTS OF JAPAN

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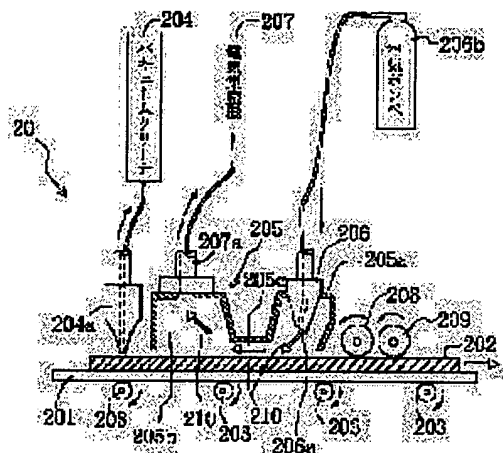
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(54) INK JET RECORDING DEVICE

(57)Abstract:

PURPOSE: To produce a high quality recording to a recording medium which has poor surface cleanability and comparatively slow drying of ink, such as corrugated board or the like by a method wherein a cleaning means, which cleanses the surface of the recording medium before printing, is provided.

CONSTITUTION: In an ink jet recording device, with which characters and images are printed onto the surface of recording medium 202 by jetting ink particles from nozzles, a cleaning means 20, which cleanses the surface of the recording medium 202 before printing is provided. Further, a drying means for drying the printed surface of the recording medium 202 is provided. As a result, high quality recording is carried out to the recording medium, which has poor surface cleanability and comparatively slow drying of ink, such as corrugated board or the like.



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CLAIMS

[Claim(s)]

[Claim 1] An ink jet recording device characterized by injecting an ink particle from a nozzle and coming to have a cleaning means which makes the surface of said record medium clarification in advance of **** in an ink jet recording device which **** an alphabetic character and an image on the surface of a record medium.

[Claim 2] An ink jet recording device characterized by injecting an ink particle from a nozzle and coming to have a cleaning means which makes the surface of said record medium clarification in advance of ****, and a desiccation means to dry the surface by which said record medium was ****(ed) in an ink jet recording device which **** an alphabetic character and an image on the surface of a record medium.

[Claim 3] Said ink jet recording device is an ink jet recording device according to claim 1 or 2 characterized by being the loading dose control mold ink jet recording device which is made to carry out the deviation scan of the ink particle, and performs **** by controlling a loading dose of an ink particle based on an alphabetic character picture signal.

[Claim 4] Said cleaning means is an ink jet recording device according to claim 1 or 2 characterized by being the thing which comes to have clarification air blow off which sprays clarification air on said record medium.

[Claim 5] Said cleaning means is an ink jet recording device according to claim 4 characterized by coming to add a dust collector which attracts dust included air and carries out uptake of the dust according to electric Coulomb force.

[Claim 6] Said cleaning means is an ink jet recording device according to claim 1 or 2 characterized by being the thing which comes to have an adhesion member which carries out adhesion removal of the dust adhering to the surface of said record medium.

[Claim 7] Said cleaning means is an ink jet recording device according to claim 1 or 2 characterized by being the thing which comes to have an adsorption member which carries out adsorption treatment of the dust adhering to the surface of said record medium.

[Claim 8] Said adsorption member is an ink jet recording device according to claim 7 characterized by being the ***** material which holds electric polarization everlastingly.

[Claim 9] Said cleaning means is an ink jet recording device according to claim 1 or 2 characterized by being the thing which comes to have a dust aspirator which carries out suction removal of the dust adhering to the surface of said record medium.

[Claim 10] Said cleaning means is an ink jet recording device according to claim 6 to 9 characterized by coming to have rocking equipment of the ultrasonic rocking equipment which gives vibrational energy to the surface of said record medium, and others.

[Claim 11] Said desiccation means is an ink jet recording device according to claim 2 characterized by being the thing which comes to have an infrared lamp.

[Claim 12] An ink jet recording device according to claim 1 to 11 characterized by coming to have the recording board which can lay a plate-like record medium with a form width [of 2m], and a vertical size of 3m.

[Claim 13] Ink jet mark **** which injects an ink particle from a nozzle and **** an alphabetic character and an image on the surface of said record medium is an ink jet recording device according to claim 1 to 12 characterized by being installed in clean housing with which clarification air flows.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention injects an ink particle from a nozzle, about the ink jet recording device which **** an alphabetic character and an image on the surface of a record medium, in case it **** to scarce corrugated paper etc. especially at surface cleaning nature, it applies it, and it relates to a suitable ink jet recording device.

[0002]

[Description of the Prior Art] Conventionally, ink jet mark copy equipment given in JP,56-151572,A, a multi-nozzle ink jet recording device given in JP,56-157588,A, etc. are proposed as this kind of an ink jet recording device. Drawing 10 shows roughly the configuration of the conventional multi-nozzle ink jet recording device, and sets it to this drawing. The ink jet arm head on which a sign 1 comes to puncture two or more nozzles 2 and 2 and -- at equal intervals (It is only hereafter called an arm head), 3 and 3, the electric charge electrode with which -- was prepared corresponding to each nozzles 2 and 2 and --, respectively, A gutter for a deflecting electrode, 6 and 6, and -- to carry out [4, 4, and --] capture recovery of the ink particle in a detection electrode, 5a, 5b, 5a and 5b, and --, The gutter communicating tube with which 7 makes gutters 6 and 6 and -- open for free passage mutually, the ink exhaust port by which 8 was prepared in the end of the gutter communicating tube 7, the recording paper with which the platen roller 10 was looped around 9, the ink tank by which 11 stores ink, and 12 are booster pumps which supply pressurization ink to an arm head 1.

[0003] Moreover, an electric charge control circuit for an excitation circuit for 13 to carry out RF excitation of the piezo piezoelectric transducer 14 attached in the arm head 1 and 15 to send out the electric charge signal according to an alphabetic character picture signal to each electric charge electrodes 3 and 3 and -- and 16 are a detector and a high voltage power supply to which 17 impresses the high voltage to deflecting electrodes 5a, 5b, 5a, and 5b and --. One electrode board 5b is connected to the high-tension-side terminal of a high voltage power supply 17, electrode board 5a of another side is connected to an earthed pole terminal, and deflecting electrodes 5a and 5b form uniform electric field between electrode board 5a and 5b.

[0004] In the above-mentioned configuration, if vibration is given to ink 18 and 18 and -- with a piezoelectric transducer 14 while driving a booster pump 12 and making ink 18 and 18 and -- blow off from each nozzles 2 and 2 of an arm head 1, and --, per for 1 second, the ink particles 19 and 19 of the number equal to the vibration frequency of a piezoelectric transducer 14, and -- will be formed. First, in case the ink particles 19 and 19 and -- pass the electric charge electrodes 3 and 3 and --, based on an alphabetic character picture signal, the electric charge of them is carried out alternatively, and they are divided into the non-electric charge ink particles 19b and 19b and -- with the electric charge ink particles 19a and 19a and --. The electric charge ink particles 19a and 19a and -- adhere to the position of the recording paper 9 in response to the deviation operation according to a loading dose with deflecting electrodes 5a and 5b.

[0005] On the other hand, the non-electric charge ink particles 19b and 19b and -- go straight on, without deviating, are captured by gutters 6 and 6 and --, and are collected by the ink tank 11 via the gutter communicating tube 7 and the ink exhaust port 8 for a reuse. Thus, the alphabetic character image pattern P is ****(ed) by the surface of the recording paper 9. In addition, the above-mentioned detection electrodes 4 and 4 and -- are the electrodes for [of the ink particles 19a and 19a and --] detecting a loading dose, each detection electrodes 4 and 4 and the signal detected by -- are sent out to a detector 16, and it is detected in a detector 16 whether the ink particles 19a and 19a and -- were able to give the predetermined loading dose.

[0006] By the way, in order to display and advertize the contents of goods in recent years, monochrome-printing or color-printing the trademark which becomes a carton box as a container from an alphabetic character graphic symbol etc., the general name of goods, a place of production, quality, efficacy, quantity, the date of manufacture, etc. is performed widely. Conventionally, printing to a carton box is performed by imprinting to plate-like corrugated paper

(only henceforth corrugated paper) before using as a box the ink attached to heights, a crevice, etc. of the original edition using the letterpress rotary press, the gravure rotary press, etc. However, if it was in the above-mentioned conventional rotary press (printing cylinder) printing, even when the printing pattern to corrugated paper was changed slightly, the original edition (the case of color printing three sheets thru/or four-sheet necessity) had to be remade, and great original edition manufacture costs and a great effort were required each time. For this reason, it replaces with the above-mentioned conventional rotary press printing, and the original edition is not needed, but there is a request that he wants to perform **** using a non-contact ink jet recording device.

[0007]

[Problem(s) to be Solved by the Invention] However, the above-mentioned conventional ink jet recording device developed as part of OA equipment is made large-sized as it is, using as **** equipment of corrugated paper has unreasonableness, and the problem which some must solve exists.

[0008] the 1st corrugated paper -- the 2,200mm of the maximum breadth, and max -- longwise -- since there is a height of 3-17mm of 3,000mm and a stage and space is widely thick, a platen roller cannot be looped around.

[0009] Corrugated paper before becoming [2nd] a box is not strictly managed about the detergency of space, in order to deal with it at a factory in many cases unlike the office form treated in office. It has meant that the paper powder (a powder-like chip, fiber piece, etc.) made into corrugated paper in case it ****s in all directions by the slitting machine, a cutter (rotary knife), etc. and is made a sheet adhered with as. In addition, since corrugated paper is wrapped in wrapping paper and dealings conveyance is not made, if dust is attached to the surface or **** so much and corrugated paper is moved, usually dust will soar. It is unsuitable to perform ink jet record to the corrugated paper which carries out a deer, and is smeared with dust in this way, and sprinkles dust on the neighborhood whole surface. It is because dust tends to adhere to the place which *****, such as a deflecting electrode, an electric charge electrode, and a nozzle, have generated, consequently a nozzle is made to start blinding or the flight path of an ink particle is put out of order for it. Moreover, the dust which the dust which floats the inside of air barred the flight of an ink particle, and has adhered to corrugated paper is because ink interrupts adhering to space, so **** quality will be spoiled remarkably.

[0010] Since corrugated paper sticks with adhesives a liner (paper of the front reverse side), and a green sand core (paper to which the stage is attached), especially, compared with the paper only for ink jets, a permeate lump of ink is bad and, for this reason, it has [3rd] an office form and the problem that dryness of adhesion ink is late.

[0011] This invention was made in view of the above-mentioned situation, is lacking in surface cleaning nature, and aims to let dryness of ink offer the ink jet recording device which can perform high quality record to record media, such as comparatively late corrugated paper.

[0012]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, it is characterized by an ink jet recording device according to claim 1 coming to have a cleaning means which makes the surface of the above-mentioned record medium clarification in advance of ****.

[0013] Moreover, it is characterized by an ink jet recording device according to claim 2 coming to have a cleaning means which makes the surface of the above-mentioned record medium clarification, and a desiccation means to dry the surface by which the above-mentioned record medium was ****(ed) in advance of ****.

[0014] Moreover, an ink jet recording device according to claim 3 is characterized by being the loading dose control mold ink jet recording device which is made to carry out the deviation scan of the ink particle, and performs **** by controlling a loading dose of an ink particle based on an alphabetic character picture signal.

[0015] Moreover, an ink jet recording device according to claim 4 is characterized by being the thing which comes to have clarification air blow off which sprays clarification air on a record medium as the above-mentioned cleaning means.

[0016] Moreover, it is characterized by an ink jet recording device according to claim 5 coming to have a dust collector which attracts dust included air and carries out uptake of the dust according to electric Coulomb force in addition to the above-mentioned clarification air blow off.

[0017] Moreover, it is characterized by an ink jet recording device according to claim 6 coming to have an adhesion member to which the above-mentioned cleaning means carries out adhesion removal of the dust adhering to the surface of the above-mentioned record medium.

[0018] Moreover, it is characterized by an ink jet recording device according to claim 7 coming to have an adsorption member to which the above-mentioned cleaning means carries out adsorption treatment of the dust adhering to the surface of the above-mentioned record medium.

[0019] Moreover, an ink jet recording device according to claim 8 is characterized by the above-mentioned adsorption member being ***** material which holds electric polarization everlastingly.

[0020] Moreover, it is characterized by coming to have a dust aspirator with which an ink jet recording device according to claim 9 carries out suction removal of the dust with which the above-mentioned cleaning means adheres to the surface of the above-mentioned record medium.

[0021] Moreover, it is characterized by coming to have rocking equipment of the ultrasonic rocking equipment with which, as for an ink jet recording device according to claim 10, the above-mentioned cleaning means gives vibrational energy to the surface of the above-mentioned record medium, and others.

[0022] Moreover, as for an ink jet recording device according to claim 11, the above-mentioned desiccation means is characterized by coming to have an infrared lamp.

[0023] Moreover, it is characterized by an ink jet recording device according to claim 12 coming to have the recording board which can lay a plate-like record medium with a form width [of 2m], and a vertical size of 3m.

[0024] Moreover, an ink jet recording device according to claim 13 is characterized by injecting an ink particle from a nozzle and installing ink jet mark **** which **** an alphabetic character and an image on the surface of the above-mentioned record medium in clean housing with which clarification air flows.

[0025]

[Function] According to the above-mentioned configuration, since the surface of a record medium is defecated by the cleaning means in advance of ****, high definition record can be attained also to record media, such as corrugated paper smeared with dust. Moreover, since dirt, such as a nozzle and an electric charge electrode, is eased, the own failure rate of an ink jet recording device is mitigated remarkably. If ink jet mark **** is especially installed in clean housing with which clarification air flows, mitigation-ization of an equipment failure rate can be attained much more. Moreover, with a desiccation means, since ***** of a record medium is dried compulsorily, after **** can aim at improvement in **** working efficiency.

[0026]

[Example] Hereafter, the example of this invention is explained with reference to a drawing. First, it outlines about the whole equipment configuration. Drawing 1 is the block diagram showing the whole ink jet recording device configuration for corrugated paper mark copies which is one example of this invention. As shown in this drawing, the ink jet recording device of this example The cleaning section 20 for removing the dust (only henceforth dust) of the paper powder which was prepared in the pre-stage of equipment and has adhered to the corrugated paper surface, and others in advance of ****, An ink particle is injected from a nozzle, it is prepared at ink jet mark **** 30 which **** an alphabetic character and an image on the corrugated paper surface which became clarification, and the tail end section of equipment, and the outline configuration is carried out from the dryer part 40 to which the forced drying of the corrugated paper surface just behind **** is carried out.

[0027] Next, each part of equipment is explained in full detail. The cross-sectional view in which drawing 2 shows the configuration of the cleaning section 20 roughly, and drawing 3 are these perspective diagrams. For an air-current room and 206, as for an electrostatic precipitator and 208, in these drawings, an air injector and 207 are [a conveyance belt for a sign 201 to lay and convey corrugated paper 202 with a maximum form width / of 2,200mm / and a maximum length size of 3,000mm, 203 and 203, the driving roller with which -- transmits driving force to a conveyance belt, and 204 / a vacuum cleaner and 205 / an adhesion roller and 209] **** rollers.

[0028] The above-mentioned vacuum cleaner 204 is equipment which carries out vacuum suction of the dust, and has suction section 204a of the shape of a cross-section horn in which corrugated paper 202 has length a breadth grade. Opposite arrangement of this suction section 204a is carried out in the condition of it being prepared in the preceding paragraph of the cleaning section 20, and meeting in the conveyance direction of corrugated paper 202, and the direction which intersects perpendicularly, and approaching or contacting the surface of corrugated paper 202.

[0029] By spraying the compressed air 210, the above-mentioned air injector 206 is equipment which blows away the dust of the corrugated paper 202 surface, and has injection-tip 206a of the shape of a slot in which corrugated paper 202 has length a breadth grade. This air injector 206 is attached in the ceiling section of the air-current room 205, it is in the condition that injection-tip 206a approaches the surface of corrugated paper 202 along the conveyance direction of corrugated paper 202, and the direction which intersects perpendicularly, and towards the upstream of the flow of corrugated paper 202, inclines and is arranged. In addition, in this example, the compressed air 210 is supplied from air bomb 206b.

[0030] The above-mentioned electrostatic precipitator 207 is equipment which gives an electric charge to the dust which attracted dust included air through suction section 207a attached in the ceiling section of the air-current room 205, and was attracted by corona discharge, and carries out the collection of the dust according to Coulomb force.

[0031] The above-mentioned air-current room 205 is a box for restricting or forming the passage of the compressed air 210 injected from an air injector 206, and is established in the latter part of the vacuum cleaner 204. An air injector 206

is attached and the air-current room 205 consists of injection room 205a by which the compressed air 210 is injected, suction room 205b by which an electrostatic precipitator 207 is attached and the **** compressed air is attracted, and connection section 205c which connects Both 205a and 205b. In addition, injection room 205a is arranged at the downstream of the flow of corrugated paper 202, and suction room 205b is arranged at the upstream. Ceiling height is low formed so that the above-mentioned connection section 205c may tend to obtain a high-speed style.

[0032] The adhesion member of for example, isobutylene isoprene rubber and others is the rotation roller which it comes to loop around the surface, and the above-mentioned adhesion roller 208 is formed in the latter part (outside of the air-current room 205) of an air injector 206. The adhesion roller 208 is arranged along the direction of breadth of corrugated paper 202 by the condition that corrugated paper can be contacted, in order to carry out adhesion removal of the dust which has still adhered to the corrugated paper 202 surface.

[0033] Moreover, a **** nonwoven fabric (for example, TOREMIKURON (registered trademark of Toray Industries, Inc.)) is the rotation roller which it comes to loop around the surface, and the above-mentioned **** roller 209 is formed in the latter part of the adhesion roller 208. The **** roller 209 is arranged along the direction of breadth of corrugated paper 202 by the condition that corrugated paper can be contacted, in order to carry out adsorption treatment of the dust which has still adhered to the corrugated paper 202 surface. Here, **** is material which holds electric polarization everlastingly and forms electric field to the perimeter also in the condition that external electric field do not exist.

[0034] Drawing 4 is the partial perspective diagram showing the outline configuration of ink jet mark **** 30. In this drawing, signs 301 and 301 and -- are arm heads, with aluminum or stainless steel, it is formed in the shape of a rectangular parallelepiped, and the ink room is established in the interior. Two or more with a diameters [10-50micro] nozzles 302 and 302 and -- are drilled in the base of each arm head 301 by a horizontal single tier and regular intervals (this example 10mm gap), making full use of laser punch technology, FOTORISO punch technology, mechanical punch technology, etc. Attachment immobilization of the piezo piezoelectric transducer 303,303 is carried out on the upper surface of each arm head 301. Moreover, the ink inlets 304 and 304 for introducing ink into an ink room and -- are prepared in the 1 side of each arm head 301 from the ink tank which is not illustrated. connecting two or more these arm heads 301 and 301 and -- with a horizontal single tier -- as a whole -- 220 nozzles 302 and 302 and -- a length of 2,200mm -- a rear spring supporter and a horizontal single tier -- and it is arranged downward. In addition, adjusting arrangement of the ***** head 301,301 comrades is carried out so that the gap of nozzle 302,302 comrades respectively nearest to the next arm head 301 may be set to 10mm.

[0035] Sequential arrangement of nozzles 302 and 302, the electric charge electrodes 3 and 3 corresponding to a perpendicular lower part of --, --, the detection electrodes 4 and 4, -- and deflecting electrodes 5a, 5b, 5a, and 5b, and -- is carried out. In addition, about the detection electrodes 4 and 4, -- and deflecting electrodes 5a, 5b, 5a, and 5b, and --, since it is the same as that of these electric charge electrodes 3 and 3, --, the above-mentioned conventional thing (drawing 10), the same sign is attached and the explanation is omitted. The gutters 305 and 305 and -- which turned capture opening for capturing a non-electric charge ink particle below of deflecting electrodes 5a, 5b, 5a, and 5b and -- up are prepared. These gutters 305 and 305 and -- are mutually opened for free passage by the gutter communicating tube 306 which consists of a long corniform pipe. A deer is carried out, and with the suction force of a suction pump 307,307, gutters 305 and 305 and the ink particle captured by -- flow to the edge of the gutter communicating tube 306, and are collected by the ink tank via the ink exhaust port 308,308.

[0036] It is conveyed from nozzles 302 and 302 and the direction of -- which intersects perpendicularly to the direction of an arrangement train, and the corrugated paper 202 defecated in the cleaning section 20 is ****(ed) by the lower part of the gutter communicating tube 306 in case [of nozzles 302 and 302 and --] a perpendicular lower part is passed.

[0037] Drawing 5 is the partial side elevation showing the outline configuration of a dryer part 40. In this drawing, a conveyance belt for a sign 401 to lay and convey corrugated paper 202 with a maximum form width [of 2,200mm] and a maximum length size of 3,000mm, 402 and 402, the driving roller with which -- transmits driving force to a conveyance belt and 403 and 403, and -- are the infrared lamps for drying quickly the surface of the corrugated paper 202 to which the ink do not yet dry as a brick has adhered, after **** is made in ink jet mark **** 30.

[0038] Next, an operation of an example is explained. If a conveyance device starts a drive, first, the corrugated paper 202 on the conveyance belt 20 reaches suction section 204a of the vacuum cleaner 204, and in this case, vacuum suction of the dust of the corrugated paper 202 surface will be carried out, and it will be removed. Subsequently, it enters in the air-current room 205, and the compressed air 210 is sprayed with an air injector 206. The dust of the corrugated paper 202 surface is blown away by this. If it comes out from an air-current room, corrugated paper will pass through the sequential adhesion roller 208 and the **** roller 209, and will be conveyed. In case it passes through the adhesion roller 208, since the corrugated paper 202 surface and the adhesion roller 208 will be in an adhesion condition, they are

rotated by the adhesion roller 208 with conveyance of corrugated paper 202. The dust on the corrugated paper 202 which was not removed with an air injector 206, either is made to carry out an adhesion imprint at this time by the direction of the adhesion roller 208. Moreover, in case it passes through the **** roller 209, since the corrugated paper 202 surface and the **** roller 209 will be in an adhesion condition, they are rotated by the **** roller 209 with conveyance of corrugated paper 202. At this time, it adsorbs and the dust which has still adhered to the corrugated paper 202 surface is removed in the direction of the **** roller 209. Thus, it defecates nearly completely [the **** surface of corrugated paper 202] certainly, and after this, corrugated paper 202 is conveyed to ink jet mark **** 30, and goes.

[0039] In corrugated paper 202, in ink jet mark **** 30, it is run in the direction of A view (main scanning direction) by the transit device which is not illustrated. Synchronizing with this transit, the electric charge signal according to an alphabetic character picture signal is sent out to each electric charge electrodes 3 and 3 and --, and the electric charge of each ink particle is carried out. According to a loading dose, the deviation scan of each ink particle is carried out by deflecting electrodes 5a, 5b, 5a, and 5b and -- in a main scanning direction (direction which intersects perpendicularly in the direction A of vertical scanning). Thus, the alphabetic character image patterns B and B and -- are ****(ed) by the corrugated paper 202 surface. After **** is made, corrugated paper 202 is conveyed by the dryer part 40.

[0040] In a dryer part 40, infrared radiation is emitted to the corrugated paper 202 surface by infrared lamps 403 and 403 and --. If the ink do not yet dry as a brick receives infrared radiation, it will evaporate quickly and drying will be promoted.

[0041] According to the above-mentioned configuration, since the surface of corrugated paper 202 is defecated completely certainly by the cleaning section 20 in advance of ****, high definition record is realizable also to the corrugated paper 202 smeared with dust. Moreover, since dirt, such as a nozzle and an electric charge electrode, is eased, the own failure rate of an ink jet recording device is mitigated remarkably. Moreover, since **** of corrugated paper 202 is compulsorily dried by the dryer part 40, after **** can aim at improvement in **** working efficiency by it.

[0042] As mentioned above, although the example of this invention has been explained in full detail with the drawing, a concrete configuration is not restricted to this example, and even if there is modification of layout of the range which does not deviate from the summary of this invention etc., it is included in this invention.

[0043] For example, although the case where formed the vacuum cleaner 204 in the preceding paragraph, and the air-current room 205 containing an air injector 206 and an electrostatic precipitator 207 was installed in the latter part in the cleaning section 20 of an above-mentioned example was described, the same effect can be acquired with having mentioned above, even if it forms the air-current room 205 which contains an air injector 206 and an electrostatic precipitator 207 in the preceding paragraph and formed the vacuum cleaner 204 in the latter part, as shown in drawing 6.

[0044] Moreover, about an air injector 206, an electrostatic precipitator 207, and the air-current room 205, it can omit suitably, and as shown in drawing 7, the cleaning section may be constituted so that it may consist of the vacuum cleaner 204, an adhesion roller 208, and a **** roller 209.

[0045] Moreover, the cleaning section may be constituted from adhesion roller 208 independent one, and you may make it constitute from **** roller 209 independent one.

[0046] moreover, little in an above-mentioned example, although the case where the vacuum cleaner 204 had long picture (there is also breadth degree of corrugated paper 202)-like suction section 204a by the shape of a cross-section horn was described -- it is -- carrying out -- you may make it use the short length suction section. The configuration of that drawing 8 and drawing 9 are little or the short length suction section is shown, drawing 8 is a side elevation and drawing 9 is a plan. In these drawings, sign 204b is little, or short length aspirator, the guide rod constructed across horizontally in the direction in which 204c intersects perpendicularly in the conveyance direction of corrugated paper 202 and the attachment section which was arranged along with guide rod 204c 204d and which it ****s, a rod and 204e are fixed to aspirator 204b, and this aspirator 204b is ****ed with guide rod 204c, and is attached free [migration on 204d of rods]. The screw-thread hole and the through tube were prepared in this attachment section 204e, the screw-thread hole was screwed on 204d of screw-thread rods, and the through tube is penetrated to guide rod 204c. A deer is carried out, and if 204d of screw-thread rods rotates with a drive motor, aspirator 204b is guided to guide rod 204c, and it will carry out suction removal of the surface dust, crossing corrugated paper 202.

[0047] It replaces with a long picture-like thing and you may make it similarly use little or a short length thing also about an air injector 206.

[0048] Moreover, you may make it add the brush roller which comes to plant much animal hairs, vegetable fibers, plastic fiber, etc. in the surface of a rotation roller to the cleaning section.

[0049] Moreover, if vibration is given to the corrugated paper surface as the rocking equipment of ultrasonic rocking

equipment and others is formed before a vacuum cleaner, an air injector, an adhesion roller, and an adsorption roller, exfoliation of dust will become easy much more.

[0050] Moreover, if ink jet mark **** 30 is installed in clean housing with which clarification air flows, a clean bench, or a clean booth, since dirt, such as a nozzle and an electric charge electrode, will be eased much more, improvement in a quality of printed character can be aimed at much more.

[0051] Moreover, in an above-mentioned example, although the case where corrugated paper was used as a record medium was described, this invention is not limited to corrugated paper, and you may make it use it for other record media, and it applies to a scarce record medium and is suitable for surface cleaning nature especially.

[0052] Moreover, in an above-mentioned example, although the KONTINIASU ink jet recording device of a loading dose control mold was described, you may be the KONTINIASU ink jet recording device of not only this but an electric-field control mold. Moreover, you may be the on-demand mold ink jet recording device by which injection of not only a KONTINIASU ink jet recording device but an ink particle is controlled based on an alphabetic character picture signal.

[0053] Moreover, in an above-mentioned example, although the case where a nozzle gap was set as 10mm was described, not only this but the nozzle number which will be used if you may change, for example, a nozzle gap is suitably set as 20mm can be reduced by half. On the contrary, if a nozzle gap is set as 5mm, high-speed record can be attained much more.

[0054] Moreover, in an above-mentioned example, although the case where a nozzle was formed directly was stated to the front wall of a head main part made from aluminum, stainless steel, etc., not only this but a front wall may be formed with a silicon wafer. With a silicon wafer, if it is made to form, a more uniform nozzle can be obtained, making full use of FOTTO lithography.

[0055] Moreover, as for this invention, it is needless to say that it is not limited to monochrome ink jet record, and can apply also to color ink jet record.

[0056]

[Effect of the Invention] Since the surface of a record medium is defecated by the cleaning means in advance of **** according to the ink jet recording device of this invention as explained above, high definition record can be attained also to record media, such as corrugated paper smeared with dust. Moreover, since dirt, such as a nozzle and an electric charge electrode, is eased, the own failure rate of an ink jet recording device is mitigated remarkably. If ink jet mark **** is especially installed in clean housing with which clarification air flows, mitigation-ization of an equipment failure rate can be attained much more. Moreover, with a desiccation means, since ***** of a record medium is dried compulsorily, after **** can aim at improvement in **** working efficiency.

[Translation done.]

* NOTICES *

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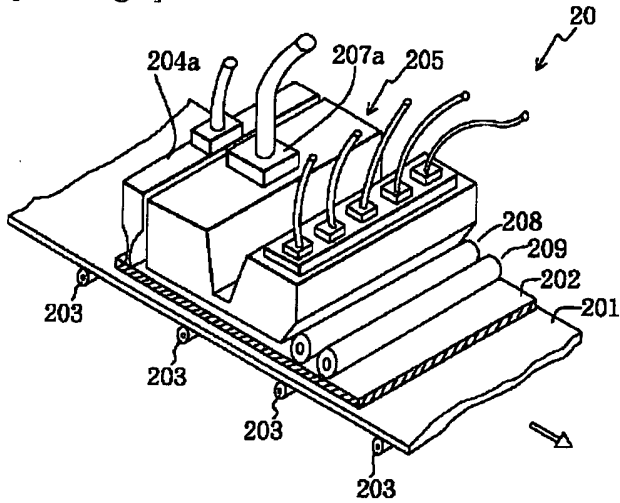
1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. **** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DRAWINGS

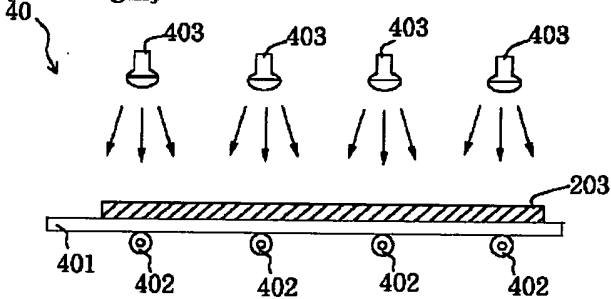
[Drawing 1]



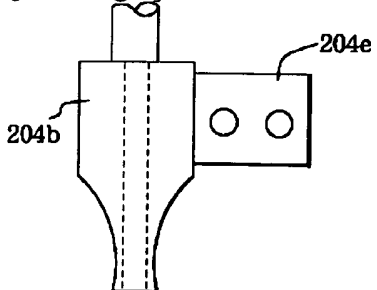
[Drawing 3]



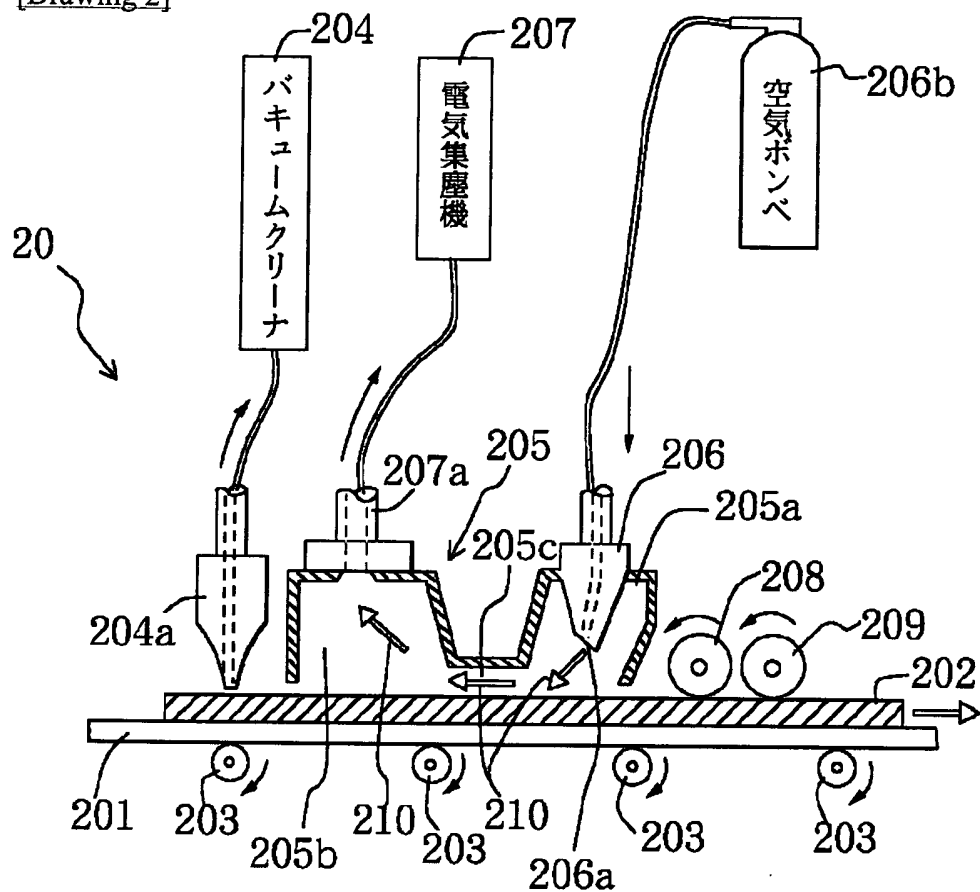
[Drawing 5]



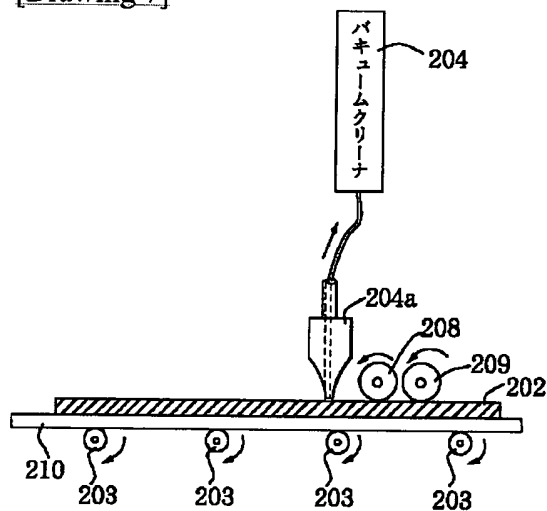
[Drawing 8]



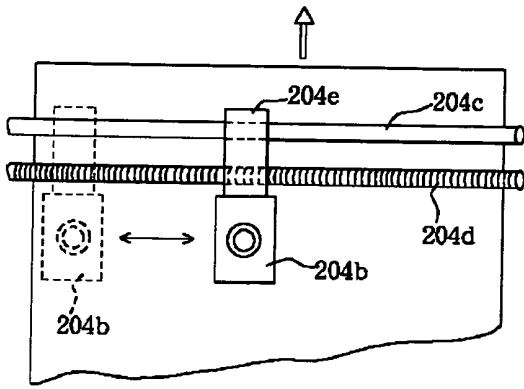
[Drawing 2]



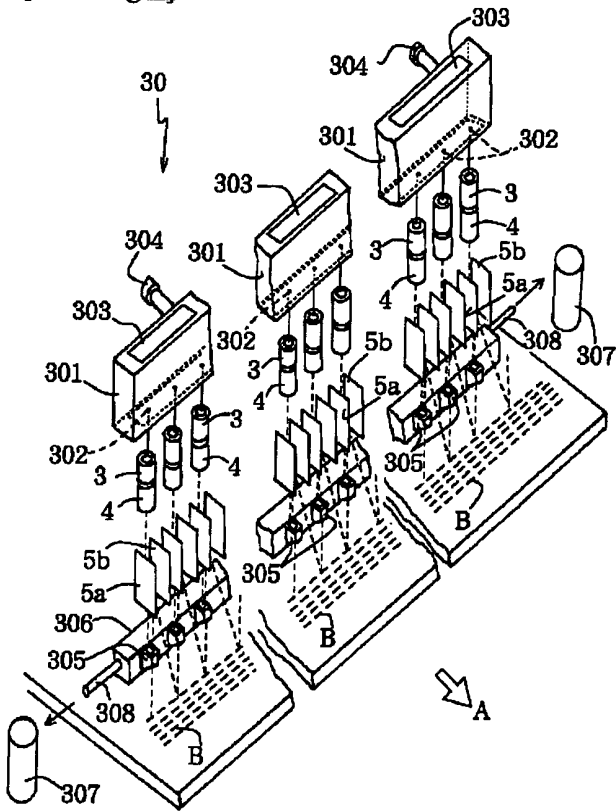
[Drawing 7]



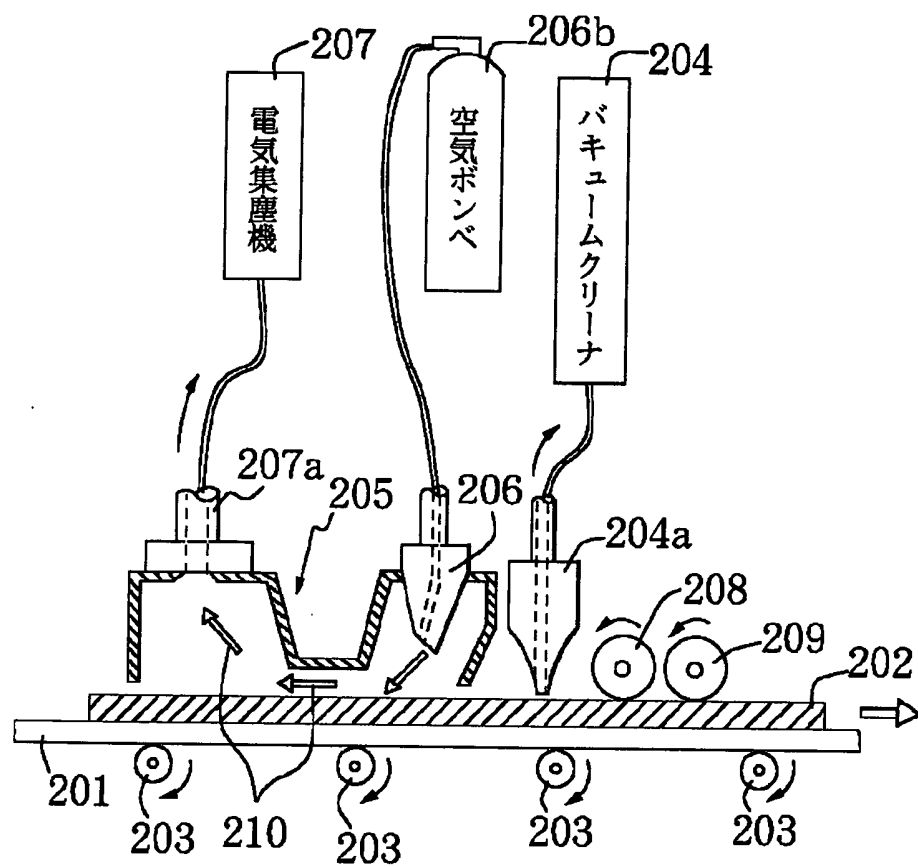
[Drawing 9]



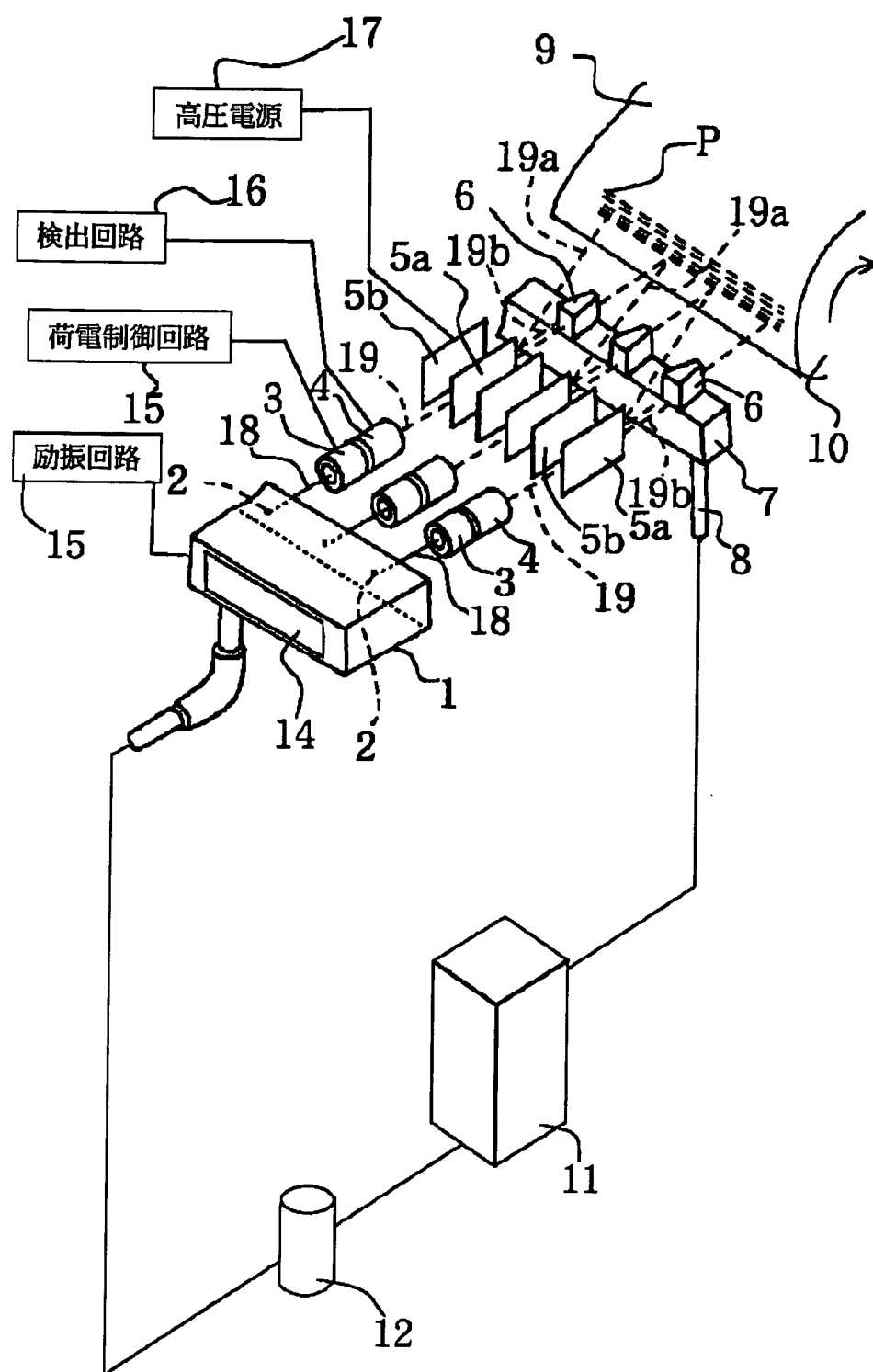
[Drawing 4]



[Drawing 6]



[Drawing 10]



[Translation done.]